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Letter dated 18 June 2009 addressed to the President of the Security Council by the Permanent Representative of France to the United Nations

Please find enclosed a list of items, materials, equipment, goods and technologies related to nuclear and ballistic programmes (see annex). I would be grateful if you could make the necessary arrangements for this list to be published as an official document of the Security Council.

(*Signed*) Jean-Maurice **Ripert**

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Annex to the letter dated 18 June 2009 addressed to the President of the Security Council by the Permanent Representative of France to the United Nations

II.A0.001 Hollow cathode lamps as follows:

a. Iodine hollow cathode lamps with windows in pure silicon or quartz

b. Uranium hollow cathode lamps

II.A0.002 Faraday isolators in the wavelength range 500–650 nm —

II.A0.003 Optical gratings in the wavelength range 500–650 nm —

II.A0.004 Optical fibres in the wavelength range 500–650 nm coated with anti-reflecting layers in the wavelength range 500–650 nm and having core diameter greater than 0,4 mm but not exceeding 2 mm

II.A0.005 Nuclear reactor vessel components and testing equipment , as follows:

1. Seals

2. Internal components

3. Sealing, testing and measurement equipment

II.A0.006 Nuclear detection systems for detection, identification or quantification of radioactive materials and radiation of nuclear origin and specially designed components therefore

II.A0.007 Bellows-sealed valves made of aluminium alloy or stainless steel type 304 or 316 L

II.A0.008 Plane, convex and concave mirrors, coated with high-reflecting or controlled multilayers in the wavelength range 500 nm-650 nm

II.A0.009 Lenses, polarisers, half-wave retarder plates, quarter-wave retarder plates, laser windows in silicon or quartz and rotators coated with anti-reflecting layers in the wavelength range 500–650 nm

II.A0.010 Pipes, piping, flanges, fittings made of or lined with nickel or nickel alloy containing more than 40% nickel by weight.

II.A0.011 Vacuum pumps as follows:

— Turbomolecular pumps having a flowrate equal to or greater than 400 l/s

— Roots-type vacuum roughing pumps having a volumetric aspiration flowrate greater than 200 m3/h Bellows-sealed, scroll, dry compressor, and bellows sealed, scroll, dry vacuum pumps

II.A0.012 Shielded enclosures for the manipulation, storage and handling of radioactive substances (hot cells).

II.A0.013 "Natural uranium" or "depleted uranium" or thorium in the form of metal, alloy, chemical compound or concentrate and any other material containing one or more of the foregoing.

II.A1.001 Bis(2-ethylhexyl) phosphoric acid (HDEHP or D2HPA) CAS 298-07-7 solvent in anyquantity, with a purity greater than 90%

II.A1.002 Fluorine gas (Chemical Abstract Number (CAS) 7782-41-4), with a purity greater than 95%

II.A1.003 Seals and gaskets made of any of the following materials

a. Copolymers of vinylidene fluoride having 75% or more beta crystalline structurewithout stretching;

b. Fluorinated polyimides containing 10% by weight or more of combined fluorine;

c. Fluorinated phosphazene elastomers containing 30% by weight or more of combined fluorine;

d. Polychlorotrifluoroethylene (PCTFE, e.g. Kel-F ®);

e. Viton fluoro-elastomers;

f. Polytetrafluoroethylene (PTFE).

II.A1.004 Personal equipment for detecting radiation of nuclear origin, including personal dosimeters

II.A1.005 Electrolytic cells for fluorine production with an output capacity greater than 100 g of fluorine per hour.

II.A1.006 Platinised catalysts specially designed or prepared for promoting the hydrogen isotope exchange reaction between hydrogen and water for the recovery of tritium from heavy water or for the production of heavy water and substitutes therefor.

II.A1.007 Aluminium and its alloys in crude or semi-fabricated form having either of the following characteristics:

a. Capable of an ultimate tensile strength of 460 MPa or more at 293 K (20°C); or

b. Having a tensile strength of 415 MPa or more at 298 K (25°C).

II.A1.008 Magnetic metals, of all types and of whatever form, having an initial relative permeability of 120 000 or more and a thickness between 0,05 and 0,1 mm

II.A1.009 "Fibrous or filamentary materials" or prepregs, as follows:

a. Carbon or aramid "fibrous or filamentary materials" having either of the following characteristics:

1. A "specific modulus" exceeding 10 × 106 m; or

2. A "specific tensile strength" exceeding 17 × 104 m;

b. Glass "fibrous or filamentary materials" having either of the following characteristics:

1. A "specific modulus" exceeding 3.18 × 106 m; or

2. A "specific tensile strength" exceeding 76,2 × 103 m;

c. Thermoset resin impregnated continuous "yarns", "rovings", "tows" or "tapes" with a width of 15 mm or less (prepregs), made from carbon or glass "fibrous or filamentary materials"

II.A1.010 Resin-impregnated or pitch-impregnated fibres (prepregs), metal or carbon-coated fibres (preforms) or "carbon fibre preforms", as follows:

a. made from "fibrous or filamentary materials" specified in II.A1.009 above;

b. Epoxy resin "matrix" impregnated carbon "fibrous or filamentary materials" (prepregs), for the repair of aircraft structures or laminates, in which the size of individual sheets of prepreg does not exceed 50 cm × 90 cm;

c. Prepregs, when impregnated with phenolic or epoxy resins having a glass transition temperature (Tg) less than 433 K (160 °C) and a cure temperature lower than the glass transition temperature.

II.A1.011 Reinforced silicon carbide ceramic composites usable for nose tips, re-entry vehicles, nozzle flaps, usable in "missiles".

II.A1.012 Maraging steels 'capable of' an ultimate tensile strength of 2 050 MPa or more, at 293 K (20°C).

Technical note:
The phrase maraging steel 'capable of' encompasses maraging steel before or after heat treatment.

II.A1.013 Tungsten, tantalum, tungsten carbide, tantalum carbide and alloys, having both of the following characteristics:

a. In forms having a hollow cylindrical or spherical symmetry (including cylinder segments) with an inside diameter between 50 mm and 300 mm; and

b. A mass greater than 5 kg.

II.A2.001 Vibration test systems, equipment and components therefore:

a. Vibration test systems employing feedback or closed loop techniques and incorporating a digital controller, capable of vibrating a system at an acceleration equal to or greater than 0,1g rms between 0,1 Hz and 2 kHz and imparting forces equal to or greater than 50 kN, measured "bare table";

b. Digital controllers, combined with specially designed vibration test software, with a 'real-time bandwidth' greater than 5 kHz designed for use with vibration test systems specified in a.;

c. Vibration thrusters (shaker units), with or without associated amplifiers, capable of imparting a force equal to or greater than 50 kN, measured 'bare table', and usable in vibration test systems specified in a.;

d. Test piece support structures and electronic units designed to combine multiple shaker units in a system capable of providing an effective combined force equal to or greater than 50 kN, measured 'bare table', and usable in vibration systems specified in a.

Technical note:
'bare table' means a flat table, or surface, with no fixture or fittings.

II.A2.002 Machine tools for grinding having positioning accuracies with 'all compensations available' equal to or less (better) than 15 µm according to ISO 230/2 (1988) (1) or national equivalents along any linear axis.

II.A2.002a Components and numerical controls, specially designed for machine tools specified in I.B.2 of document S/2006/814 and in II.A2.002 above.

II.A2.003 Balancing machines and related equipment as follows:
a. Balancing machines, designed or modified for dental or other medical equipment, having all the following characteristics:

1. Not capable of balancing rotors/assemblies having a mass greater than 3 kg;

2. Capable of balancing rotors/assemblies at speeds greater than 12 500 rpm;

3. Capable of correcting unbalance in two planes or more; and

4. Capable of balancing to a residual specific unbalance of 0,2 g mm per kg of rotor mass;

b. Indicator heads designed or modified for use with machines specified in a. above.

Technical note:
Indicator heads are sometimes known as balancing instrumentation.

II.A2.004 Remote manipulators that can be used to provide remote actions in radiochemical separation operations or hot cells, having either of the following characteristics:

a. A capability of penetrating 0,3 m or more of hot cell wall (through the wall operation); or

b. A capability of bridging over the top of a hot cell wall with a thickness of 0,3 m or more (over the wall operation).

Technical note:
Remote manipulators provide translation of human operator actions to a remote operating arm and terminal fixture. They may be of 'master/slave' type or operated by joystick or keypad.

II.A2.005 Controlled atmosphere heat treatment furnaces, as follows:

Furnaces capable of operation at temperatures above 400°C.

II.A2.006 Oxidation furnaces capable of operation at temperatures above 400°C

II.A2.007 'Pressure transducers', capable of measuring absolute pressures at any point in the range 0 to 200 kPa and having both of the following characteristics:

a. Pressure sensing elements made of or protected by "Materials resistant to corrosion by UF6", and

b. Having either of the following characteristics:

1. A full scale of less than 200 kPa and an 'accuracy' of better than ± 1% of full scale; or

2. A full scale of 200 kPa or greater and an 'accuracy' of better than 2 kPa.

Technical note:
'accuracy' includes non-linearity, hysteresis and repeatability at ambient temperature.

II.A2.008 Liquid-liquid contacting equipment (mixer-settlers, pulsed columns, centrifugal contactors); and liquid distributor, vapour distributor or liquid collectors designed for such equipment, where all surfaces that come in direct contact with the chemical(s) being processed are made from any of the following materials:

1. Alloys with more than 25% nickel and 20% chromium by weight;

2. Fluoropolymers;

3. Glass (including vitrified or enamelled coating or glass lining);

4. Graphite or 'carbon graphite';

5. Nickel or alloys with more than 40% nickel by weight;

6. Tantalum or tantalum alloys;

7. Titanium or titanium alloys;

8. Zirconium or zirconium alloys; or

9. Stainless steel.

Technical note:
'Carbon graphite' is a composition consisting of amorphous carbon and graphite, in which the graphite content is 8% or more by weight.

II.A2.009 Industrial equipment and components , as follows:

Heat exchangers or condensers with a heat transfer surface area greater than 0,05 m2, and less than 30 m2; and tubes, plates, coils or blocks (cores) designed for such heat exchangers or condensers, where all surfaces that come in direct contact with the fluid(s) are made from any of the following materials:

1. Alloys with more than 25% nickel and 20% chromium by weight;

2. Fluoropolymers;

3. Glass (including vitrified or enamelled coatings or glass lining);

4. Graphite or 'carbon graphite';

5. Nickel or alloys with more than 40% nickel by weight;

6. Tantalum or tantalum alloys;

7. Titanium or titanium alloys;

8. Zirconium or zirconium alloys;

9. Silicon carbide;

10. Titanium carbide; or

11. Stainless steel.

Note: This item does not control vehicle radiators.

II.A2.010 Multiple-seal, and seal-less pumps, suitable for corrosive fluids, with manufacturer's specified maximum flow-rate greater than 0,6 m3/hour, or vacuum pumps with manufacturer's specified maximum flow-rate greater than 5 m3/hour (measured under standard temperature (273 K (0 °C)) and pressure (101,3 kPa) conditions); and casings (pump bodies), preformed casing liners, impellers, rotors or jet pump nozzles designed for such pumps, in which all surfaces that come in direct contact with the chemical(s) being processed are made from any of the following materials:

1. Stainless steel,

2. Aluminium alloy.

II.A2.011 Centrifugal separators, capable of continuous separation without the propagation ofaerosols and manufactured from:

1. Alloys with more than 25% nickel and 20% chromium by weight;

2. Fluoropolymers;

3. Glass (including vitrified or enamelled coating or glass lining);

4. Nickel or alloys with more than 40% nickel by weight;

5. Tantalum or tantalum alloys;

6. Titanium or titanium alloys; or

7. Zirconium or zirconium alloys.

II.A2.012 Sintered metal filters made of nickel or nickel alloy with a nickel content of 40% or more by weight.

II.A3.001 High voltage direct current power supplies having both of the following characteristics:

a. Capable of continuously producing, over a time period of eight hours, 10 kV or greater, with output power of 5 kW or greater with or without sweeping; and

b. Current or voltage stability better than 0,1% over a time period of four hours.

II.A3.002 Mass spectrometers, capable of measuring ions of 200 atomic mass units or greater and having a resolution of better than 2 parts in 200, as follows, and ion sources therefor:

a. Inductively coupled plasma mass spectrometers (ICP/MS);

b. Glow discharge mass spectrometers (GDMS);

c. Thermal ionisation mass spectrometers (TIMS);

d. Electron bombardment mass spectrometers which have a source chamber constructed from, lined with or plated with "Materials resistant to corrosion by UF6";

e. Molecular beam mass spectrometers having either of the following characteristics:

i. A source chamber constructed from, lined with or plated with stainless steel or molybdenum and equipped with a cold trap capable of cooling to 193 K (– 80 °C) or less; or

2. A source chamber constructed from, lined v ith or plated with "Materials resistant to corrosion by UF6";

f. Mass spectrometers equipped with a microfluorination ion source designed for actinides or actinide fluorides.

II.A6.001 Yttrium alun inium garnet (YAG) rods

II.A6.002 Infrared optics in the wavelength range 9–17 μm and components therefor, including cadmium telluride (CdTe) components.

II.A6.003 Wave front corrector systems for use with a laser beam having a diameter exceeding 4 mm, and specially designed components therefor, including control systems, phase front sensors and "deformable mirrors" including bimorph mirrors.

II.A6.004 Argon ion "lasers" having an average output power equal to or greater than 5 W

II.A6.005 Semiconductor "lasers" and components therefor, as follows:

a. Individual semiconductor "lasers" with an output power greater than 200 mW each, in quantities larger than 100;

b. Semiconductor "laser" arrays having an output power greater than 20 W.

Notes:

1. Semiconductor "lasers" are commonly called "laser" diodes.

3. This item does not control "laser" diodes with a wavelength in the range 1 200-2 000 nm

II.A6.006 Tunable semiconductor "lasers" and tunable semiconductor "laser" arrays, of a wavelength between 9 μm and 17 μm, as well as array stacks of semiconductor "lasers" containing at least one tunable semiconductor "laser array" of such wavelength.

Notes:

1. Semiconductor "lasers" are commonly called "laser" diodes.

II.A6.007 Solid state "tunable" "lasers" as follows, and specially designed components therefor:

a. Titanium-sapphire lasers;

b. Alexandrite lasers.

II.A6.008 Neodymium-doped (other than glass) "lasers", having an output wavelength exceeding 1 000 nm but not exceeding 1 100 nm and output energy exceeding 10 J per pulse.

II.A6.009 Components of acousto-optics, as follows:

a. Framing tubes and solid-state imaging devices having a recurrence frequency equal to or exceeding 1kHz;

b. Recurrence frequency supplies;

c. Pockels cells.

II.A6.010 Radiation-hardened cameras, or lenses therefore, specially designed or rated as radiation hardened to withstand a total radiation dose greater than 50 × 103 Gy(silicon) (5 × 106 rad (silicon)) without operational degradation.

Technical note:

The term Gy(silicon) refers to the energy in Joules per kilogram absorbed by an unshielded silicon sample when exposed to ionising radiation.

II.A6.011 Tunable pulsed dye laser amplifiers and oscillators, having all of the following characteristics:

1. Operating at wavelengths between 300 nm and 800 nm;

2. An average output power greater than 10 W but not exceeding 30 W;

3. A repetition rate greater than 1 kHz; and

4. Pulse width less than 100 ns.

Notes:

1. This item does not control single mode oscillators.

II.A6.012 Pulsed carbon dioxide "lasers" having all of the following characteristics:

1. Operating at wavelengths between 9 000 nm and 11 000 nm;

2. A repetition rate greater than 250 Hz;

3. An average output power greater than 100 W but not exceeding 500 W; and

4. Pulse width of less than 200 ns.

II.A7.001 Inertial systems and specially designed components, as follows:

I. Inertial navigation systems which are certified for use on "civil aircraft" by civil authorities of a State participating in the Wassenaar Arrangement, and specially designed components, as follows:

a. Inertial navigation systems (INS) (gimballed or strapdown) and inertial equipment designed for "aircraft", land vehicle, vessels (surface or underwater) or "spacecraft" for attitude, guidance or control, having any of the following characteristics, and specially designed components therefor:

1. Navigation error (free inertial) subsequent to normal alignment of 0,8 nautical mile per hour (nm/hr) 'Circular Error Probable' (CEP) or less (better); or

2. Specified to function at linear acceleration levels exceeding 10 g;

b. Hybrid inertial navigation systems embedded with Global Navigation Satellite Systems(s) (GNSS) or with "Data-Based Referenced Navigation" ("DBRN") System(s) for attitude, guidance or control, subsequent to

normal alignment, having an INS navigation position accuracy, after loss of GNSS or "DBRN" for a period of up to four minutes, of less (better) than 10 metres 'Circular Error Probable' (CEP);

c. Inertial Equipment for Azimuth, Heading, or North Pointing having any of the following characteristics, and specially designed components therefore:

1. Designed to have an Azimuth, Heading, or North Pointing accuracy equal to, or less (better) than 6 arc minutes RMS at 45 degrees latitude; or

2. Designed to have a non-operating shock level of 900 g or greater at a duration of 1 msec, or greater.

Note:
The parameters of I.a. and I.b. are applicable with any of the following environmental conditions:

1. Input random vibration with an overall magnitude of 7,7 g rms in the first half hour and a total test duration of one and one half hour per axis in each of the three perpendicular axes, when the random vibration meets the following:

a. A constant power spectral density (PSD) value of 0,04 g2/Hz over a frequency interval of 15 to 1 000 Hz; and

b. The PSD attenuates with frequency from 0,04 g2/Hz to 0,01 g2/Hz over a frequency interval from 1 000 to 2 000 Hz;

2. A roll and yaw rate of equal to or more than + 2,62 radian/s (150 deg/s); or

3. According to national standards equivalent to 1. or 2. above.

Technical notes:

1. I.b. refers to systems in which an INS and other independent navigation aids are built into a single unit (embedded) in order to achieve improved performance.

2. Circular Error Probable' (CEP) — In a circular normal distribution, the radius of the circle containing 50% of the individual measurements being made, or the radius of the circle within which there is a 50% probability of being located.

II. Theodolite systems incorporating inertial equipment specially designed for civil surveying purposes and designed to have an Azimuth, Heading, or North Pointing accuracy equal to, or less than 6 arc minutes RMS at 45 degrees latitude, and specially designed components therefore.

III. Inertial or other equipment using accelerometers specified in 9.A.3 of document S/2009/205, where such accelerometers are specially designed and developed as MWD (Measurement While Drilling) sensors for use in downhole well services operations.

II.B.001 Technology required for the development, production or use of the items in Part A (Goods) above.